



US005292362A

**United States Patent [19]****Bass et al.****[11] Patent Number: 5,292,362****[45] Date of Patent: \* Mar. 8, 1994****[54] TISSUE BONDING AND SEALING COMPOSITION AND METHOD OF USING THE SAME****[75] Inventors:** Lawrence S. Bass, Little Neck, N.Y.; Steven K. Libutti, Fort Lee, N.J.; Alexander M. Eaton, Durham, N.C.**[73] Assignee:** The Trustees of Columbia University in the City of New York, New York, N.Y.**[\*] Notice:** The portion of the term of this patent subsequent to May 11, 2010 has been disclaimed.**[21] Appl. No.: 727,607****[22] Filed:** Jul. 9, 1991**Related U.S. Application Data****[63] Continuation-in-part of Ser. No. 560,069, Jul. 27, 1990, Pat. No. 5,209,776.****[51] Int. Cl.<sup>5</sup> ..... C09J 189/00; C09J 199/00****[52] U.S. Cl. .... 106/124; 106/126; 106/128; 106/135; 106/137; 106/157; 106/158; 106/161; 106/162; 106/178; 106/217; 106/287.2; 106/287.21; 106/287.35; 514/773; 514/776; 606/214****[58] Field of Search .....** 106/124, 126, 128, 135, 106/137, 157, 158, 161, 162, 178, 217, 287.2, 287.21, 287.35; 514/773, 776; 606/214**[56] References Cited****U.S. PATENT DOCUMENTS**

- 3,438,374 4/1969 Falb et al. .  
4,122,853 10/1978 Smith .  
4,362,567 12/1982 Shwarz et al. .  
4,414,976 11/1983 Schwarz et al. .  
4,550,238 10/1985 Van Herle et al. .  
4,625,724 12/1986 Suzuki .  
4,633,870 1/1987 Saver .  
4,657,820 4/1987 Halpern et al. .... 106/157  
4,672,969 6/1987 Dew .  
4,676,790 6/1987 Kern .  
4,782,819 11/1988 Adair .  
4,818,291 4/1989 Iwatsuki et al. .  
4,854,320 8/1989 Dew et al. .

4,909,251 3/1990 Seelich .

**OTHER PUBLICATIONS**

CA85(19):138042h, Gorog et al, 1976 (no month avail.). K. K. Jain "Repair of small blood vessels with the neodymium yag laser" Surgery vol. 85 No. 6 pp. 684-688 (1979) (no month avail.).

R. L. Burleson et al "Fibrin Adherence to biologic tissues" J. Surg. Research 25,523-529 (1978) (no month avail.).

Khalid J. Awan et al "use of Isobutyl -2- Cyanoacrylate tissue adhesive" Annals of Opth pp. 851-853 (Aug. 1974).

J. A. Favez et al "Tubal Microsurgery with the Carbon dioxide Laser" Am. J. obster. Gynecol 146/4 (1983) (no month avail.).

G. F. Gestring et al "Autologous Fibrinogen for tissue adhesion . . ." Vas. Surg pp. 294-304 (Sep./Oct. 1983). F. X. Brunner "Histological findings in sutured and fibrin-glued Microvascular Anastomosis" A. Otor. 240;311-318 (1984) (no month avail.).

J. A. Favez et al "Comparison of Tubal Surgery with the co2 Laser . . ." Fert. and Ster. vol. 40 No. 4 (Oct. 1983).

J. K. Choe et al "Clinical and Histological evaluation of Laser Reanastomosis . . ." Fert. and Ster. vol. 41 No. 5 (May 1984).

E. L. Smith et al "Principles of Biochemistry" 7th Edition pp. 7 and 229 (1983) (no month avail.).

R. R. Krueger et al "Argon Laser Coagulation of Blood for the Anastomosis of small vessels" Laser in Surg. ±Med 5:55-60 1985 (no month available).

(List continued on next page.)

**Primary Examiner—David Brunsman**  
**Attorney, Agent, or Firm—John P. White****[57] ABSTRACT**

Disclosed is a composition for bonding separated tissues together or for coating tissues or prosthetic materials including at least one natural or synthetic peptide and at least one support material which may be activated by energy and to methods of making and using the same.

**42 Claims, No Drawings**